

## **TOBACCO CESSATION: AVAILABLE TREATMENT MODALITIES, LIMITATIONS, AND SOLUTIONS**

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Tobacco Addiction, Epidemiology, and CV side effects.

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### **ABSTRACT**

Tobacco use is associated with 5 million deaths per year worldwide and is considered as one of the leading causes of premature death.<sup>[1]</sup> The few reports of tobacco use in different population groups report its prevalence from about 15% to over 50% among men.<sup>[2]</sup> Differences in its prevalence are rather wide for the non-smoking forms. Overall, smoking causes 1 in 5 deaths.<sup>[1]</sup> Long-term effects of smoking include lung and throat cancer due to tar in cigarettes. Carbon monoxide in cigarettes also reduces the amount of oxygen available to the muscles, brain, and blood. Overtime, this causes airways to narrow and blood pressure to rise, which leads to cardiovascular effects.<sup>[3]</sup> The chance that a lifelong smoker will die prematurely from a complication of smoking is approximately 50%.<sup>[1]</sup>

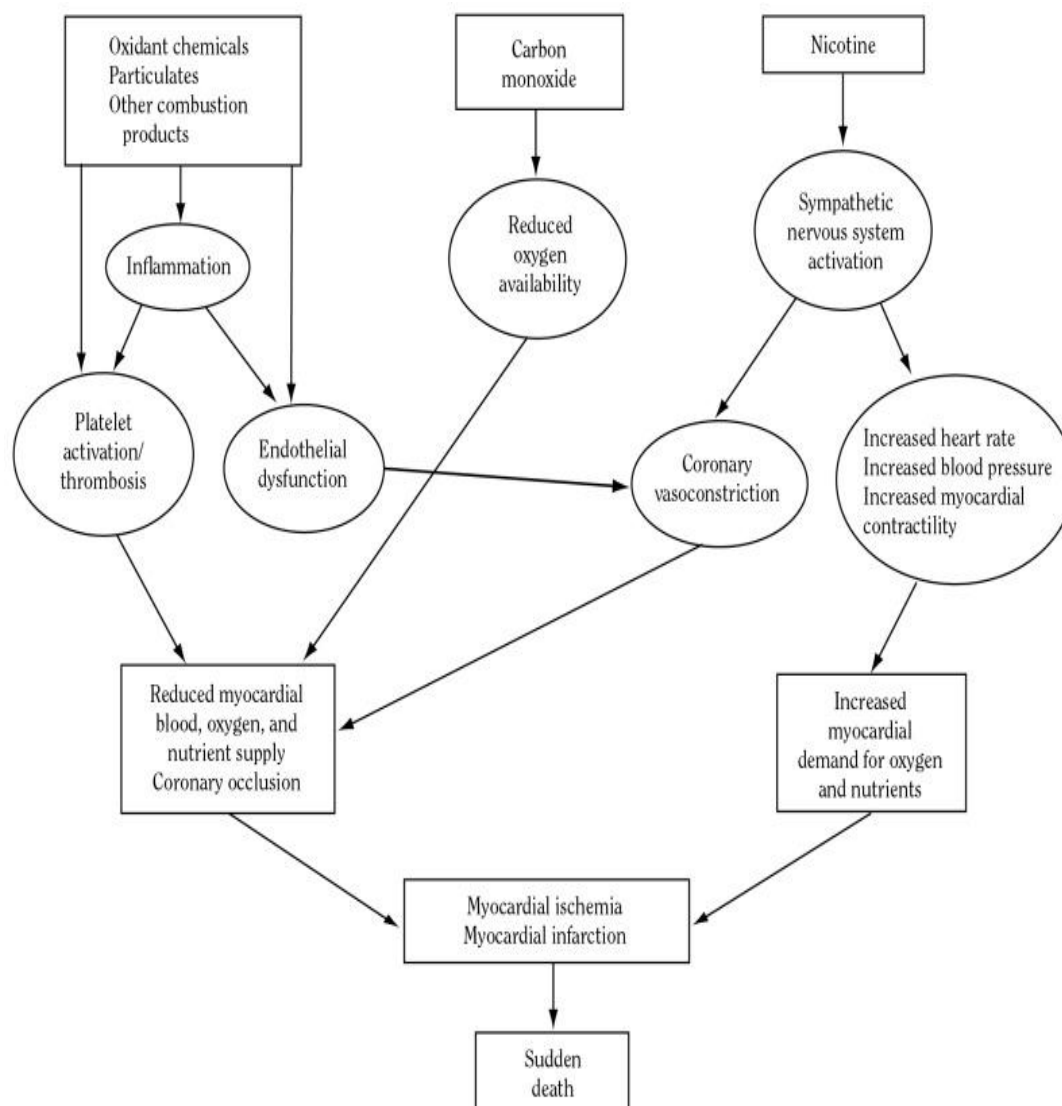
### **INTRODUCTION**

Smoking is a highly efficient form of drug administration. Inhaled nicotine enters the circulation rapidly through the lungs and moves into the brain within seconds. Rapid rates of absorption and entry into the brain cause a strongly felt “rush” and reinforce the effects of the drug.<sup>[1]</sup>

Tobacco consumption is also linked indirectly to increased cardiovascular events and abundant evidence demonstrates that smoking contributes to development of atherosclerotic plaque. The general mechanism includes development of atherosclerotic changes with narrowing of the vascular lumen and induction of a hypercoagulable state, which create risk of acute thrombosis.<sup>[4]</sup>

Cigarette smoking produces acute myocardial ischemia by adversely affecting the balance of demand for myocardial oxygen and nutrients with myocardial blood supply. The increase in demand for oxygen in the myocardium is a consequence of nicotine stimulation of the sympathetic nervous system and the heart. Cigarette smoking acutely increases levels of plasma norepinephrine and epinephrine and enhanced 24-hour urinary excretion of these catecholamines. Regular smoking increases the heart rate both in the short term (up to 20 beats per minute) and throughout the day (average increase, 7 beats per minute), as measured during ambulatory monitoring. Nicotine also increases heart rate, blood pressure, and myocardial contractility.

These hemodynamic changes result in increases in myocardial work that in turn require increased myocardial blood flow.<sup>[4]</sup>



**Figure 1: Tobacco use leading to cardiovascular events pathway.**

#### Available Treatment Modalities, limitations, and solutions

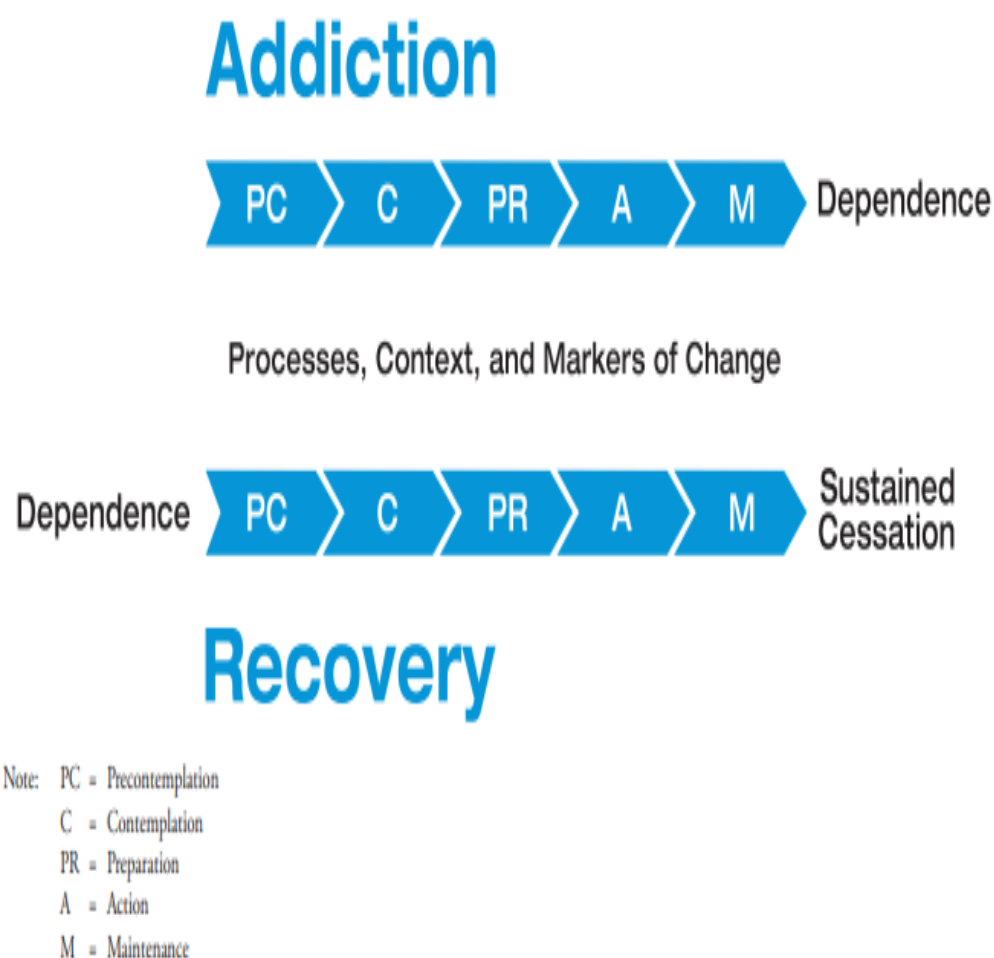
Smoking cessation is associated with clear health benefits and all smokers should be advised to quit smoking. Withdrawal produces a constellation of symptoms that tobacco users may experience when they stop tobacco use abruptly. Symptoms vary but include a craving for nicotine, irritability, frustration or anger, anxiety, depression, difficulty concentrating, restlessness, and increased appetite (which can lead to weight gain). Most symptoms reach maximum intensity 24 to 48 hours after cessation and then gradually diminish over a period of a few weeks. Some withdrawal symptoms, such as dysphoria, mild depression, anhedonia, and increased appetite, may persist for months.<sup>[5]</sup>

Interventions to encourage smoking cessation range from simple information and suggestions to smoking cessation classes, to nicotine replacement, to community or

national campaigns that promote non-smoking to pharmacotherapy.<sup>[6]</sup> However, many programs often fail as they do not realise that quitting smoking is a dynamic process and several unsuccessful quit attempts may be involved before finally succeeding. It is essential to identify the characteristics of the smokers who have tried to quit but unsuccessful. Age, gender, level of education, believe that smoking causes serious illness, place of residence, and lack of a community approach and follow-ups contribute to unsuccessful smoking cessation among adults.<sup>[7]</sup>

A popular model includes five stages of cessation: Precontemplation, Contemplation, Preparation, Action, and Maintenance. These five stages may recur in the smoker's career since repeated relapses and efforts to quit are common, many successful quitters reporting several prior attempts. Thus the process of quitting may extend over a number of years.<sup>[7]</sup>

Figure 7.1. Overview of the Stages of Addiction and Recovery



Adapted from *Addiction and Change: How Addictions Develop and Addicted People Recover*, with permission from author.<sup>63</sup>

### Behavioural Modifications

Lifestyle modification and behavioural modification are important. Patient education should be given during the initial visit and revisited over the course of a year during follow-up visits for each patient. Suggestions could include counter-conditioning such as waiting an additional 5 minutes before lighting up, smoking a cigarette only halfway, and/or reducing smoking by 1 cigarette per day every other day. Patients should be encouraged to keep a "cigarette diary" from the time of the initial visit to the specified quit date to track tapering of tobacco use. In reality, few patients' taper tobacco use (cigarette fading) significantly during this preparation phase, but the point of becoming "mentally" ready is reinforced with this exercise. Instruction should also include suggestions about stimulus control, such as removing visual cues and staying away from situations that make them want to smoke. For example, patients may be encouraged to remove ashtrays from the home

and workplace and to avoid alcohol and bars where smoking commonly occurs. Each patient's family, friends, and significant others should be encouraged to provide support. It is believed that a support system could assist the smoking cessation candidate through the preparation, action, and maintenance phases.<sup>[7]</sup>

### Fagerstrom Test

The Fagerstrom Test for Nicotine Dependence (FTND) is a 6-item questionnaire designed to assist the healthcare professional in determining the likelihood of nicotine dependence. A score of 6 or greater (maximum score of 10) on the FTND indicates a high level of nicotine dependence. The FTND, along with a history of prior attempts to quit, is a valuable tool for determining a course of action for smoking cessation. Therapeutic interventions are based on the FTND, previous attempts to quit, and patient preferences.<sup>[7]</sup>

Questions and Possible Answers	Score
<b>How soon after you wake up do you smoke your first cigarette?</b>	
≤ 5 min	3
6-30 min	2
31-60 min	1
≥ 61 min	0
<b>Do you find it difficult to refrain from smoking in places where it is forbidden (eg, in church, at the library, in a cinema)?</b>	
Yes	1
No	0
<b>What cigarette would you hate most to give up?</b>	
The first in the morning	1
Any other	0
<b>How many cigarettes per day do you smoke?</b>	
≤ 10 (≤ 0.5 pack)	0
11-20 (0.5 -1 pack)	1
21-30 (1 - 1.5 packs)	2
≥ 31 (≥ 1.5 packs)	3
<b>Do you smoke more frequently during the first hours after waking than during the rest of the day?</b>	
Yes	1
No	0
<b>Do you smoke when you are so ill that you are in bed most of the day?</b>	
Yes	1
No	0
<b>TOTAL SCORE:</b>	<b>_____ (Max. Score = 10)*</b>
*Scores of 6 or greater generally are interpreted as indicating a high degree of dependence, with more severe withdrawal symptoms, greater difficulty in quitting, and possibly the need for higher doses of medication.	

Social support for quitting is associated with cessation and long-term abstinence. This support can come from professionals as well as from family and friends. Clinical experience suggests tremendous individual variability in style-as opposed to presence or absence-of preferred social support. The importance of continued support and encouragement of cessation is illustrated in the Multiple Risk Factor Intervention Trial (MRFIT). This trial offered an intensive initial cessation emphasis, and throughout its five-year course, professional monitoring every four months, programs for renewed cessation efforts for those who relapsed, and frequent activities for MRFIT participants and their family members to promote maintained abstinence. Six years after randomization, one year after the end of MRFIT, 48.9% of those who smoked at baseline were abstinent, in contrast to 28.8% of those in the usual-care control group.<sup>[8]</sup>

### Canada Ottawa Model

The Ottawa Model for Smoking Cessation (OMSC) is a clinical approach to tobacco dependence treatment found to increase smoking abstinence by an absolute 11% in hospitalized patients (28). Implemented in >300 Canadian health care sites, the OMSC incorporates the '5As' approach to consultation (Ask, Advise, Assess, Assist and Arrange), pharmacotherapy and follow-up support through an automated telephone triage system to link smokers requiring assistance to nurse specialist counselling. A modified version of the OMSC adapted for outpatients has been tested in a stroke prevention clinic; however, no such study has been conducted in an outpatient population with respiratory diseases. Smoking cessation is the only intervention that can slow disease progression in individuals with respiratory diseases such as COPD, and should be an integral component of every service for pulmonary patients. Therefore, evidence regarding the effectiveness of smoking cessation programs in this specific population is needed.

### NAPCON Update

The CAPA survey results recently presented @ NAPCON '16 by Singh and Krishnaprasad on behalf of 202 nationally representative sample of pulmonologists in India again highlighted the pertinent issues of non- and pseudo-adherence in real-world clinic settings of India where most doctors (71%, n = 100) agreed that patients utilize the current conventional pMDIs including the dose counter analog devices till the “last” spray thereby exposing them to risk of “persistent” symptoms and/or exacerbations.<sup>[11]</sup>

### Digital pMDIs: Defines Adherence Prevents Pseudo Adherence

The digital dose countered pMDIs [Figure 2] offer a large digital display for easy accessibility and comprehension by the varied patient population utilizing the device including elderly. Second, the “end” display at the exhaustion of the labeled 120 dosages heralds the start of the subtherapeutic tailed sprays that the patients’ needs to avoid. This seems to be of therapeutic relevance in our real-world settings while assessing the current referral cases of partly or uncontrolled cases for any other differential diagnoses.<sup>[12]</sup>



Figure 2: Digital dose counter pressurized metered-dose inhalers with “END” display signifies “START” of “Tail”ed sprays!!

### Digital pMDIs Clinical Evidence

The clinical impact of digital pMDI was assessed and reviewed by the DUSS panel involving ≈500 doctors across India, and they found that these devices offer significant improvement in the asthma status that was either newly diagnosed or poorly controlled with conventional therapy or devices.<sup>[12]</sup>

### CONCLUSION

Counselling and medications can help many patients to achieve abstinence. Professionals have a role in providing brief smoking cessation advice and education. Support to prepare for and during a quit attempt is best provided by health professionals with the appropriate knowledge and skills. In combination, these different levels of support, combined with pharmacotherapy,

significantly increase an individual’s chance of managing to stop smoking successfully.

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